Patent Claims

1. A heat exchanger (1), in particular for air conditioning systems, in particular for motor vehicles, having at least one collecting tube (4, 5; 65) and a holding element which is attached to a collecting tube (4, 65), characterized in that the holding element (16, 26, 61) can be secured to the collecting tube by positive locking.

2. The heat exchanger as claimed in claim 1, characterized in that the holding element (16, 26, 61) is adapted to the external shape of the collecting tube (4, 25, 65).

3. The heat exchanger as claimed in one of the preceding claims, characterized in that the holding element is in the shape of a C section (16, 62) which engages around the collecting tube (4, 65).

4. The heat exchanger as claimed in one of the preceding claims, characterized in that the holding element, in particular the C section (16), is clipped to the collecting tube (4).

5. The heat exchanger as claimed in one of the preceding claims, characterized in that the collecting tube (4) is constructed in two pieces and has a lid (8) and a bottom (10) which form offset longitudinal edges (13), and characterized in that the C section (16) has limbs (21, 22) with ends (21a, 22a) which are supported on the longitudinal edges (13).

6. The heat exchanger as claimed in one of the preceding claims, characterized in that a flange (7, 60) for securing connecting tubes (5, 6) is

attached to the collecting tube by means of the holding element.

7. The heat exchanger as claimed in claim 6, characterized in that the holding element (16, 61) has a web (15, 61a) by means of which the holding element (16, 61) is connected to the flange (7, 60).

8. The heat exchanger as claimed in claim 6 or 7, characterized in that the holding element (16, 61) is constructed in one piece with the flange (7, 60), in particular as an extruded part.

9. The heat exchanger as claimed in one of claims 6 to 8, characterized in that the connecting tubes (5, 6) can be secured at the ends to the collecting tube (4, 65) on the one hand and to the flange (7, 60) on the other, and can in particular be soldered simultaneously to the flange (7, 60) and the heat exchanger (1).

10. The heat exchanger as claimed in claim 8 or 9 characterized in that the holding element (61) can be secured to the collecting tube (65) by means of a securing element (64).

11. The heat exchanger as claimed in claim 10, characterized in that the holding element (61) has a longitudinal groove (63) for holding the securing element (64b).

12. The heat exchanger as claimed in claim 10 or 11, characterized in that the collecting tube (65) has an opening (66) for accommodating the securing element (64a).

13. The heat exchanger as claimed in claim 11 and 12, characterized in that the securing element (64) is

caulked to the collecting tube (65) and is clamped to the holding element (61).

14. The heat exchanger as claimed in one of claims 1 to 7, characterized in that the holding element (26) is in the shape of a web (27) with a straight lower edge (27a) and with bent limbs (30, 31) with lower edges (30a, 31a), and characterized in that the holding element (26) is arranged with its lower edges (27a, 30a, 31a) standing on the collecting tube (25), in which case the lower edges (30a, 31a) of the limbs (30, 31) are adapted to the rounded portion (25b) of the collecting tube (25).

15. The heat exchanger as claimed in claim 14, characterized in that the web (27) is constructed as a holding plate with attachment openings (28, 29), and the limbs (30, 31) are constructed as supporting elements.

16. The heat exchanger as claimed in either of claims 14 and 15, characterized in that the holding element (26) has, in particular in the region of the web (27), a lug (32) on its lower side (27a), said lug (32) being capable of being plugged into a slot (25a) in the collecting tube (25).

17. The heat exchanger as claimed in claim 1 or 2, characterized in that the holding element (44) is embodied as an extruded part.

18. The heat exchanger as claimed in claim 17, characterized in that the holding element (44) has a C-shaped section (51), which comprises the collecting tube (42), with a central rib (50) and the collecting tube (42) has a slot for receiving the rib (50).

19. The heat exchanger as claimed in claim 18, characterized in that the holding element (44) has a holding plate (44b) which adjoins the C section (44c).

20. The heat exchanger as claimed in claim 18 or 19, characterized in that the C section (51) forms a soldering face in which grooves (52) which run in the extrusion direction are arranged.

21. The heat exchanger as claimed in claim 19 or 20, characterized in that attachment openings or cutouts (44a) are arranged in the holding plate (44b).

22. The heat exchanger as claimed in one of claims 17 to 21, characterized in that in each case two holding elements (44, 45, 46, 47) are attached to the collecting tubes (42, 43).

23. The heat exchanger as claimed in one of the preceding claims, characterized in that the heat exchanger is, in particular, a soldered capacitor, in which case the heat exchanger has in particular heat exchanger tubes and ribs which are combined to form a tube/rib block.